

**Progress Report
Pacific Islands Regional Integrated Ocean Observing System (Pacific IOOS)**

**Submitted by
Eileen L. Shea, East-West Center
January 2006**

1.0 Progress on Regional Association Development

This report covers the period from June 1 through November 30, 2005. The notice of award for first-year funding for the Pacific Islands Integrated Ocean Observing System (PacIOOS)¹ was received on July 29, 2005 although the official start date on the grant is listed as June 1, 2005. This grant began the formal process of planning for the development of a Pacific Islands IOOS program and the Regional Association governance structure that will support it.

PacIOOS activities during the performance period covered by this Progress Report addressed the following objectives associated with the emergence of an effective Pacific IOOS regional program:

- **Ensure broad engagement of key stakeholders and partner institutions** in the development of an initial Pacific IOOS program with continuing efforts to assess progress, address problems and explore new opportunities;
- **Identify critical information needs** in the high-priority areas described above including completion of an inventory of existing observing systems and information products, the identification of critical gaps and the development of recommendations for new or enhanced ocean information products; and
- **Establish appropriate program oversight, coordination and implementation mechanisms** to support a Pacific IOOS regional program.

Key activities and highlights of accomplishments during the June – November 2005 period include:

- Continued to support the work of the Observations and Data Management hui of the interagency Pacific Risk Management 'Ohana (PRiMO) to identify risk management information needs and priorities and augment the ongoing inventory of current ocean observing systems supporting risk management in the PacIOOS region;

¹ PacIOOS is being designed to address ocean observations requirements and priorities in the American Flag Pacific Islands (Hawaii, Guam, American Samoa and the Commonwealth of the Northern Mariana Islands) and the U.S. Affiliated Pacific Islands including the Federated States of Micronesia, the Republic of the Marshall Islands and the Republic of Palau.

- Continued support for the Pacific Islands Global Ocean Observing System (PI-GOOS) through service on the PI-GOOS steering committee and dialogue and joint planning with the PI-GOOS Program Officer at the South Pacific Applied Geosciences Commission (SOPAC);
- Continued support for the Pacific Islands Global Climate Observing System (PI-GCOS) through service on the PI-GCOS steering committee and dialogue and joint planning with the PI-GCOS Program Officer at the Secretariat for the Pacific Regional Environment Programme (SPREP);
- Established a collaborative working relationship with the new NOAA Integrated Data and Environmental Applications – NOAA IDEA – Center through which IDEA Center staff will support education/outreach and data management activities during the development phase of PacIOOS. Education/Outreach Specialist, Lynn Nakagawa, came on-board in October 2005 and Data Management Specialist, Eric Wong, will join the staff in early January 2006;
- With the arrival of an Education/Outreach Specialist, began development of a PacIOOS website and prepared a one-page PacIOOS handout for distribution for use in discussions with current and potential PacIOOS partners and beneficiaries;
- Continued discussions with University of Hawaii scientists, private sector firms and Federal agencies to further define and develop their interest in and potential contributions to a Pacific Regional IOOS/GCOOS program;
- Presented an update on PacIOOS planning and the development of an integrated wave and water level information product line at the November 2005 meeting of the All Islands Coastal Zone Management group organized by the Hawaii State Coastal Zone Management Program. This meeting was a follow-on to the initial engagement of the All Islands group at their June 2004 meeting in Saipan, Commonwealth of the Northern Mariana Islands;
- Conducted an introductory PacIOOS Symposium in American Samoa in conjunction with Workshop on the Consequences of Climate Variability and Change in American Samoa organized by the East-West Center in collaboration with the American Samoa Department of Commerce and the American Samoa Coastal Zone Management Program. The September 2005 Symposium was the first in what will be a series of introductory PacIOOS planning meetings in the American Flag and U.S. Affiliated Pacific Islands and was designed to support the identification of initial PacIOOS priorities in these jurisdictions and facilitate the establishment of a local PacIOOS planning capability including designation of a PacIOOS liaison in each jurisdiction. A summary of the Workshop and Symposium findings and recommendations was presented to the Governor of American Samoa and is attached as an appendix to this Progress Report;

- Continued discussions with scientific staff responsible for developing a Pacific NEON program of terrestrial ecosystem observations in the American Flag and U.S. Affiliated Pacific Islands regarding potential areas of collaboration. NEON program staff and contractors invited to participate in a December 2005 Workshop on a Wave and Water Level Data Framework at the East-West Center (see below);
- Worked with the Pacific Risk Management 'Ohana (PRiMO), NOAA's Pacific Services Center, the Pacific Disaster Center, the NOAA IDEA Center and the East-West Center to organize and co-sponsor a December 2005 Wave and Water Level Data Framework Workshop. The Workshop was organized to help advance the development of a wave and water level product line as an early PacIOOS priority in response to deliberations of the PRiMO observations and data management hui. Through the participation of the PI-GCOS program officer from SPREP and the PI-GOOS program officer from SOPAC, the Workshop was also designed to advance the goal of aligning wave and water level data collection, archiving, integration and sharing throughout the Pacific Region. The Workshop involved significant participation from: NOAA line organizations and program offices; other Federal agencies including USGS and DHS/FEMA; scientists and technical personnel from the East-West Center, the University of Hawaii (including the International Pacific Research Center and the School of Ocean and Earth Science and Technology), the Pacific Disaster Center, the Richard Hagemeyer Pacific Tsunami Warning Center, the IOC/UNESCO International Tsunami Information Center and the University of Alaska-Fairbanks/International Arctic Research Center. A Workshop summary will be included in the next PacIOOS progress report.

2. Priorities for Observations from a Regional Perspective

No significant changes to the general priorities described in the March 2005 semi-annual Progress Report.

Participation in the deliberations of the PRiMO observations and data management hui and discussions with the All Islands Coastal Zone Management group confirmed the importance of the development of enhanced information on wave and water level risks which are being addressed as an initial PacIOOS and PRiMO priority.

Deliberations during the American Samoa PacIOOS Symposium identified a number of initial data and information priorities in that jurisdiction including:

Marine and Coastal Ecosystems

- Address issues related to the long-term operations and maintenance of observing systems, including exploration of the role of automated stations and remote-sensing technologies;
- Resources to support trend analyses of ecosystem, species and community changes over time to support resources managers;
- Detecting and monitoring biological responses to changing ocean conditions such as coral bleaching and ENSO events (also supports Climate and Coastal Communities);
- Establishment of a rapid-response capability to support enhanced ecosystem observations during extreme events or critical periods (e.g., coral bleaching and ENSO events)

Climate and Coastal Communities

- Rainfall, streamflow and wind measurements (also supports Risk Management);
- Wave and water level variations including changes in sea level;
- Sea surface temperature and ocean temperature at depth (also supports Marine and Coastal Ecosystems);
- Analysis of current and projected trends in tropical storm frequency, intensity and tracks (also supports Climate and Risk Management);
- Vulnerability assessments to support climate adaptation and risk management:
 - Coastal climatology (wind, waves, sea level, storms, erosion)
 - Community-based assessments that provide an integrated look at social, economic, environmental and infrastructure implications

Risk Management

- Lidar surveys for coastal erosion, coastal inundation and changing coastline conditions;
- Monitoring changes in “protective” coastal ecosystems such as coral reefs and mangroves (also supports Climate and Coastal Communities and Marine and Coastal Ecosystems);
- Vulnerability/risk assessment data and maps (see similar need in Climate and Coastal Communities); and
- Assessing and monitoring changing conditions associated with coastal development projects (also supports Marine and Coastal Ecosystems).

Crosscutting Needs

- Development and provision of information in appropriate, user-friendly and accessible formats designed to support decision-making;
- Addressing cultural, social and language issues – setting PacIOOS information products in an appropriate cultural setting and integrating traditional and local knowledge;
- Continuous education and training opportunities especially in light of staff turnover within Pacific Islands;
- Regional collaboration in development of GIS-based relational database tools;
- Regional collaboration in standardizing formats, storage and access to data and metadata.

While not all of these high-priority information needs are specific to IOOS, it is essential for PacIOOS planning to understand and address the context for ocean observations in the Pacific and look for opportunities to leverage related programs and resources to serve multiple purposes.

As noted in the initial semi-annual report in March 2005, the Pacific IOOS team believes that *one of the highest priorities for FY07 and beyond is the explicit identification of sufficient funding for the Regional Program component of IOOS* as well as National Backbone funding priorities in Agency budget requests to Congress. This includes, as a high priority, securing the legislative and executive branch authorities to move from the current funding situation to a truly national program with sufficient funding for full national coverage in both planning AND implementation of regional IOOS programs.

3.0 Issues, Challenges and Opportunities

- PacIOOS will continue to explore exciting opportunities to link Pacific IOOS ocean ecosystem observing and data management activities with similar observational and data management interests of the *NEON program* that focuses on long-term observations of terrestrial ecosystems. The Hawaiian resource management concept of ahupua'a – from the mountain ridge to the outer edge of the coral reef – acknowledges the importance of addressing resource management and ecosystem health issues in an integrated fashion in the coastal zone. One specific area of shared interest is in meeting the data integration and visualization challenges that both programs face and, with support from the NOAA IDEA Center, we are considering the possibility of joint planning workshop on that subject in early 2006.

- The Pacific IOOS team continues to be involved in the development of a Pacific Islands Climate Information System (PaCIS) in the context of identifying and addressing climate-related aspects of Pacific IOOS. A PaCIS program framework describing the integration of climate observations, forecasting, research, research, modeling, assessment, data management and education is currently being developed. In addition to providing regional climate services to American Flag and U.S. Affiliated Pacific Islands, PaCIS is being developed in the context of a U.S. contribution to the emergence of a Regional Climate Centre for Oceania under the auspices of the World Meteorological Organization (RA-V).
- Consistent with last year's RA consensus on the need to fully fund regional planning activities at funding levels greater than are currently available, the Pacific IOOS team would like to draw attention to the increasing demands for time, people and money to contribute to a variety of implementation activities at the national level such as the IOOS demonstration project, DMAC, national-level education planning, etc. These activities are placing increasing demands on already over-constrained Regional budgets and personnel.
- The PacIOOS team continues to be somewhat concerned about ongoing discussions regarding the participation of Federal agencies as full partners in RA activities. Full participation of local Federal partners is essential to the ultimate success of the Pacific IOOS regional program, for example, and we suspect that the same is true for many if not all of the other regions. This should not be a question of IF but a question of HOW.

Selected Findings and Recommendations
Workshop on Climate Variability and Change in American Samoa and
Symposium on PacIOOS

- Highlighted the high level of awareness among participants representing American Samoa Government, local Federal agencies and key economic development interests who participated regarding the consequences of climate variability (El Niño) and change for American Samoa communities, businesses and natural resources.
- Through presentations, group discussions and exercises, participants developed greater insight into how El Niño affects rainfall (droughts), hurricanes and other extreme events (landslides) and developed a greater appreciation for how forecasts of El Niño could be used to reduce vulnerability through more effective decisions in areas like emergency management, water resource management and fisheries.
- Participants developed a greater appreciation for the potential vulnerability of American Samoa communities, infrastructure, key economic sectors (fisheries) and resources (coral reefs) and Government agencies in the face of the anticipated consequences of longer-term changes in climate such as sea level rise, changes in hurricane intensity and the possibility of prolonged droughts.
- Recognizing the importance of enhancing the resilience of American Samoan communities, businesses and natural resources, the participants

RECOMMENDED:

- Implementation of the Governor's recommendation to create a Territorial Climate Task Force comprising relevant Government Departments, Federal partners and community representatives.
 - Development of a Climate Action Plan to guide/facilitate risk management and preparedness actions in response to forecasts of El Niño and support the development of climate adaptation plans for Government, villages and businesses.
 - Enhanced public awareness and climate education campaigns in Government Departments, villages and key economic sectors.
 - Recognition that effective adaptation to climate change will require a partnership between Government and local villages and a commitment to a participatory program of community-based vulnerability assessment and adaptation (using guidelines similar to those recently developed by SPREP).
- Recognizing that the emerging Pacific Islands Integrated Ocean Observing System (PacIOOS) provides an opportunity for American Samoa Government, resource managers, businesses and local Federal partners to help get access to new ocean data products and information services, the participants

ENCOURAGED the Governor to move quickly to name an American Samoa PacIOOS liaison to serve as a local focal point for input on national and regional ocean observation priorities and the coordination of local PacIOOS planning and educational activities. Participants felt that to be most effective, the PacIOOS liaison should be in a position to address needs and priorities in all three PacIOOS themes (weather and climate forecasting and adaptation, hazards risk management and marine and coastal ecosystems) in the context of American Samoa's sustainable development programs.